

REMARKS

The Examiner has rejected claims 1, 8 and 14 under 35 USC 102(b) as being anticipated by the Philippe et al. (4 820 299). She has rejected claims 3, 8 – 9 and 15 under 35 USC 103(a) as being unpatentable over Philippe et al. in view of Bokros et al. 5 843 183, she has rejected claim 16 under 35 USC 103(a) as being unpatentable over Philippe et al., in view of Patke et al. (US 6 296 663) and she has rejected claim 17 under 35 USC 103(a) as being unpatentable over Philippe et al in view of Woo et al. (US 6 761 736).

Philippe et al. (US 4 820 299) discloses a prosthetic cardiac valve with a plurality of valve flaps which are supported on the circumferential wall of the valve by a guide and retaining mechanism 16, 17, 18, 19 such that, in the open position, the inner corners of the flap 5 6, 7 come to bear against the internal wall 4, that is, for opening the valve they are moved downstream with the blood flow.

This is exactly contrary to the arrangement according to the invention wherein valve flap support projections 19, 190, 191 extend from the annular body 11 into the flow passage and the inwardly extending ends are provided with pivot joints 18, 180, 181 on which the flap elements 12, 120, 121 are supported pivotally about a pivot axis which extends through adjacent pivot joints. In this arrangement, the pivot joints are disposed closer to the center of the blood flow passage where they are exposed to a more intense flow of blood so that no blood stagnation occurs at the joints. .

Such an arrangement wherein the valve flaps are supported on inwardly projecting pivot joints so that, upon opening the valve, flow passages are provided in the center of the valve and between each valve flap and the surrounding housing wall and all parts of the valve, the pivot joints and the valve ring wall are exposed to the blood flow, is not disclosed in any of the cited references so that claim 1 as amended to define the invention in greater detail is certainly not anticipated. A preferred arrangement with three valve flaps is defined in detail in claim 11, which has already been accepted by the Examiner.

Since the concept of placing the pivot joints for the valve flaps radially inwardly into the flow of blood through the valve, so that the pivot joints (and at the same time, the valve ring) are exposed to a more intense blood flow, is not disclosed in any of the references cited

by the Examiner no combination of the cited references could possibly lead to the arrangement as defined in amended claim 1 and, consequently, claim 1 as amended could not possibly be considered to be obvious from the cited references.

Reconsideration of claim 1 as amended is respectfully requested.

Claims 3, 8 – 9 and 15 which have been rejected by the Examiner as being obvious from Philippe et al. in view of Bokros et al. are directed to detail features which are known per se, but considered to be advantageous in connection with the arrangement as now more distinctly defined in claim 1.

These claims depend on claim 1 and therefore include all the features of claim 1 so that they should be patentable together with claim 1.

The same applies to claim 16 and 17, which define that the flap elements consist of titanium or a titanium alloy or, respectively, are coated by a hard material layer. These claims, too, should be patentable together with claim 1. Reconsideration of claims 3, 8 – 9 and 15 – 17 is therefore respectfully requested.

A new claim 18 dependent on claim 1 is submitted herewith, which defines, in principle, the arrangement of the valve flaps with pivotal joints disposed on inwardly extending projection so as to be pivotable about a pivot axis arranged such that the flow cross-section covered by each outer flap part between the pivot axis and the annular body 11 is larger than flow cross-section covered by the valve flap part in the center area of the annular body and the outer valve flap parts are therefore opened by the blood flow through the valve in the direction of the blood flow and the inner valve flap parts in the center of the annular body are opened against the flow of blood through the valve. Furthermore, during opening of the valve, the blood flow through the valve is directed first to the circumferential walls, that is, the annular body 11 of the valve so that no stagnation of blood and no depositions occur there either. With for example three valve flaps, four flow passages are formed in this way as shown in Figs. 3 to 8 and also in Fig. 9 where also the flow direction of the blood is indicated by arrow 25 with the valve flap 121 shown in an open position in which the outer parts of the valve flaps are pivoted in downstream direction and the inner parts are pivoted in an upstream direction against the flow of the blood through the valve. Consideration of claim 18 is respectfully requested

Claims 2, 4, 5 – 7, 11 to 13 have been considered by the Examiner to include patentable subject matter. They should now be patentable as it is believed that, upon reconsideration of claim 1 as amended, the Examiner will agree that claim 1 is now patentable.

Allowance of claims 1 – 18 is solicited.

Respectfully submitted,

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